**POWER OF ATTORNEY OR AUTHORIZATION OF AGENT** 

#### Not Yet Assigned Application Number Herewith Filing Date Brian Whitman First Named Inventor Extracting Classifying Data (etc.) Title Not Yet Assigned **Group Art Unit** Not Yet Assigned **Examiner Name** 14855 **Attorney Docket Number**

I hereby appoint:		Place Customer		
	Customer Number 23389	Number Bar Code Label here		
OR Practitioner(s) na	amed below:			
Tracamono / no	Name	Registration Number	l	
			l	
as my/our attorney(s) or business in the United S	r agent(s) to prosecute the applicati States Patent and Trademark Office	ion identified above, and to transact all econnected therewith.		
The above-mention	espondence address for the above- ned Customer Number.			
OR Practitioners at Cu	stamer Number	Place Customer Number Bar Code	•	
OR	Storiler (Admiser	Label here		
Firm or Individual Name				
Address				
Address				
City		State Zip		
Country	<u> </u>			
Telephone		Fax		
I am the:	4			
X Applicant/Inventor.				
Assignee of record of the entire interest. See 37 CFR 3.71.  Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).				
	SIGNATURE of Applicant or As	ssignee of Record		
Name Gary	W. Flake			
Signature	my be-Hain			
Date 8-24-01				
NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.				
	orms are submitted.	vary depending upon the needs of the individual case. Any comm	nente or	

Burden Hour Statement: This form is estimated to take 3 minutes to complete. It will vary depending upon the needs of the Individual case. Any Continuous Case the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Weshington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

# **POWER OF ATTORNEY OR AUTHORIZATION OF AGENT**

TOZUMO TUMO O MODEO

Application Number	Not Yet Assigned		
Filing Date	Herewith		
First Named Inventor	Brian Whitman		
Title	Extracting Classifying Data (etc.)		
Group Art Unit	Not Yet Assigned		
Examiner Name	Not Yet Assigned		
Attorney Docket Number	14855		

I hereby appoir	nt:		-			٦
OR	ers at Customer Number	23389		<b>→</b>   '^	Place Customer Number Bar Code abel here	
☐ Practitione	er(s) named below:		<del>-  </del>		<del></del>	
ļ	Name		F	Registration	Number	]
<del></del>			+	, <del>,,,,,,</del>		
			+			
			-			
	Company (company)					in'
as my/our attorned	ey(s) or agent(s) to prosect United States Patent and I	cute the application i	dentified nnected t	above, and herewith.	I to transact all	
	he correspondence addres					
	mentioned Customer Num					
OR	Г				e Customer aber Bar Code	
	s at Customer Number				el here	
OR						
Firm or Individual Na	ime				<del></del>	
Address						
Address						
City			State		Zip	
Country						
Telephone			Fax			
I am the:						
Applicant	t/Inventor.					
Assignee of record of the entire interest. See 37 CFR 3.71.						
Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).						
SIGNATURE of Applicant or Assignee of Record						
Name	Stephen R. Lawrence	_				
Signature	XT C					
Date.	(6.17.4/2 = 1					
NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.						
✓ Total of 3	forms are submitted.					
	form is estimated to take 3 minutes	to complete. Time will vary	depending up	on the needs o	of the individual case. Any	comments or

Burden Hour Statement: This form is estimated to take 3 minutes to complete. It may any depending upon the needs of the individual case. Any continents on the amount of time you are required to complete this form should be sent the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

PTO/SB/81 (02-01)

Approved for use through 10/31/2002. OMB 0651-0036

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it display a valid OMB control number.

# **POWER OF ATTORNEY OR AUTHORIZATION OF AGENT**

Vet Assigned			
Not Yet Assigned			
Herewith			
Brian Whitman			
Extracting Classifying Data (etc.)			
Yet Assigned			
Not Yet Assigned			
355			
֡			

OR	er(s) named below:	Registr	Place Customer Number Bar Code Label here ration Number		
	ey(s) or agent(s) to prosecute the application United States Patent and Trademark Office o				
The above-	he correspondence address for the above-idementioned Customer Number.  s at Customer Number	entified application	Place Customer Number Bar Code Label here		
Individual Na	me				
Address Address		<del>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</del>			
City		State	Zip		
Country					
Telephone		Fax			
I am the:  Applicant/Inventor.  Assignee of record of the entire interest. See 37 CFR 3.71.  Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).					
	SIGNATURE of Applicant or Assi	gnee of Record			
Name	Brian Whitman				
Signature	181				
Date					
NOTE: Signatures of all forms if more than one	I the Inventors or assignees of record of the entire intensignature is required, see below.	est or their represent	ative(s) are required. Submit multiple		
II "Total of 3	forms are submitted.				
Burden Hour Statement: This	form is estimated to take 3 minutes to complete. Time will var	y depending upon the n	eeds of the individual case. Any comments		

the amount of time—you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washing 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

who wish to find music by a particular artist. It can also be used in converting large sets of music data to the digital domain; instead of manually entering artist information, the system could automatically make the classification. The representation generated by the system of the present invention can also be used as a recommendation agent for content-based music retrieval.

### Brief Description of the Drawings

[0017] These and other features, aspects, and benefits of the present invention will become better understood with regard to the following description, appended claims, and accompanying drawings, where like reference numerals refer to like components across the several views:

[0018] Fig. 1 shows the flow path of a Music Classifier according to the present invention.

[0019] Fig. 2 shows the flow path of the Learning Representation Generator according to the present invention.

[0020] Fig. 3 shows the flow path of the multi-stage classifier according to the present invention.

#### Detailed Description of the Invention

[0021] Referring to Fig. 1, the system 100 begins by receiving an audio signal from some source 102. The source 102 generates a signal 103 which contains audio content, which can be a recording from CD or other media, a received broadcast, a file that stores the music data, or even input from a live performance. The signal 103 is either resampled or directly copied by a Pulse Code Modulation (PCM) encoding circuit 104, which outputs a digital representation of audio signal 103, which is audio bitstream 105.

[0022] Next, the audio bitstream 105 is transformed by a perceptual representation (PR) generator 106 into PR 107. From this PR, a learning representation (LR) generator 108 transforms the PR into LRs 109. The LRs 109 output from the LR generator 108 are input into a multi-stage classifier 110, which after proper training will be capable of distinguishing between a variety of artists to which it